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James Stekelberg
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“Leveling the Playing Field: Unbiased Tests of the Relative Information Content of Book Income and Taxable Income”

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Leveling the Playing Field:
Unbiased Tests of the Relative Information Content of Book Income and Taxable Income

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Abstract: In this study, I document that at least a portion of the superior ability of book income relative to taxable income to explain the market value of equity may be due to market mispricing arising from investors’ fixation on book income and underemphasis on the information contained in taxable income, rather than book income’s superior information content. I find that this result generally intensifies as book earnings quality and tax planning decrease. Indeed, I show that once market mispricing is removed from the valuation model, taxable income possesses statistically equivalent or even superior ability relative to book income to explain firm value among firms with particularly low book earnings quality and firms that engage in a relatively low degree of tax planning. This study adds to the growing literature on the informativeness of firms’ tax-related financial statement disclosures by demonstrating that prior research may have conducted tests of value relevance that are inherently biased in favor of book income and, consequently, understated the relative information content of taxable income.

I am indebted to my dissertation committee: Liz Chuk, Chuck Swenson, and especially Bob Trezevant (chair) for guidance throughout the development of this project. This paper has also benefited from the insightful comments of Eric Allen, Bryce Schonberger, K.R. Subramanyam, Kara Wells, and workshop participants at the University of Southern California. All errors are my own.
reported in firms' financial statements, this issue is also pertinent to the policy debate on book/tax conformity (e.g., Hanlon and Shevlin, 2005). In particular, if the information content of taxable income has been understated by prior studies, then so has the information that would be lost if taxable income were conformed to book income.

In my empirical tests, I compare the abilities of book income and taxable income to explain the market value of equity and the ex-post intrinsic value of equity (Subramanyam and Venkatachalam, 2007). The market value of equity is a function of investors' potentially-biased expectations of future earnings and terminal stock price, and is therefore likely tainted by the same sources of market mispricing that confound the tests performed by Hanlon et al. (2005) and Ayers et al. (2009). On the other hand, ex-post intrinsic value attempts to remove market mispricing from the valuation model by replacing investors' ex-ante expectations of future earnings and terminal stock price in the residual income model with five years of their ex-post realizations. Consequently, using ex-post intrinsic value allows me to conduct tests of the relative information content of book income and taxable income that overcome documented biases arising from investors' fixation on book income and underemphasis on taxable income when forecasting earnings and pricing securities.

Consistent with Hanlon et al. (2005), I find that book income possesses superior ability relative to taxable income to explain the market value of equity. However, if at least part of this superiority is attributable to market mispricing of the information contained in the two measures of income, then I expect that book income's superior ability to explain firm value will decrease once market mispricing is removed from the valuation model. The results of my tests bear out

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2 Hanlon et al. (2005) and Ayers et al. (2009) use returns (changes) rather than price (levels) specifications in their studies. Subramanyam and Venkatachalam (2007) note that using ex-post intrinsic value precludes the use of a changes specification. I argue that my results are comparable to those reported by Hanlon et al. and Ayers et al. because Kothari and Zimmerman (1995) suggest that price and returns frameworks are theoretically equivalent.
predict that once market mispricing is removed from the valuation model, the decrease in the superior explanatory power of book income will intensify as book earnings quality and tax planning decrease.

The results of my tests are consistent with this prediction. Specifically, I find that when ex-post intrinsic value replaces the market value of equity as the measure of firm value, the superior explanatory power of book income relative to taxable income increases by 18.05% then decreases by 6.77%, 62.46%, 44.20%, and 233.31% in the first (highest book earnings quality) through fifth (lowest book earnings quality) quintiles of discretionary accruals, respectively. Similarly, when ex-post intrinsic value replaces the market value of equity as the measure of firm value, the superior explanatory power of book income relative to taxable income decreases by 20.38%, 17.19%, 26.33%, 37.50%, and 77.38% in the first (highest tax planning) through fifth (lowest tax planning) quintiles of cash ETRs, respectively. These trends show that the decrease in book income's superior explanatory power generally intensifies as book earnings quality and tax planning decrease. Indeed, I find that when ex-post intrinsic value replaces the market value of equity as the measure of firm value, taxable income possesses statistically equivalent or even superior ability relative to book income to explain firm value among firms with particularly low book earnings quality and among firms that engage in a relatively low degree of tax planning.

This study contributes to the literature on the valuation of the tax information reported in firms' financial statements. For example, Hanlon et al. (2005) document that book income possesses superior ability relative to taxable income to explain contemporaneous stock returns. However, I find that book income’s superior ability to explain firm value decreases once market mispricing arising from investors’ fixation on book income and underemphasis on taxable income is removed from the valuation model. In this way, I show that Hanlon et al. may have
2. Background, Prior Literature, and Hypothesis Development

2.1 Background Information on Book Income and Taxable Income

In the United States, firms report one measure of income to shareholders on their income statements and another measure of income to tax authorities on their tax returns. I refer to these measures of income as book income and taxable income, respectively. Book income is calculated pursuant to Generally Accepted Accounting Principles (GAAP), the objective of which is to provide relevant and faithfully-represented accounting information to financial statement users such as current or potential investors and creditors (FASB, 2010). On the other hand, taxable income is calculated according to the tax law, the objective of which is to raise revenue for the federal government and achieve policy objectives such as encouraging or discouraging certain activities and supporting certain industries (Scholes et al., 2008).

Book income and taxable income are aligned to a large extent, as evidenced by prior research documenting that firms must frequently make tradeoffs between reporting relatively high book income but paying higher taxes or reporting relatively low book income but paying lower taxes (e.g., Erickson et al., 2004; Guenther et al., 1997). Despite many similarities, however, considerable differences exist between book income and taxable income due to the different objectives and sources of GAAP rules and tax law. Many of these differences arise from the fact that book income is calculated under the accrual basis whereas taxable income, although generally accrual-based, is in many ways calculated pursuant to a method of accounting that is closely related to the cash method. For example, in calculating taxable income, firms are often not permitted to record revenue before cash is received or deduct expenses before cash is paid. As a result, the determination of taxable income lacks much of the subjectivity and

\[ \text{Note:} \text{However, it is important to note that taxable income and cash flows are not merely proxies for one another. In untabulated robustness tests, I find that taxable income and pretax cash flows from operations are correlated at 0.68.} \]
statement users with an estimate of a firm’s taxable income. Although Hanlon (2003) identifies a number of reasons why this estimate of taxable income likely does not equal actual taxable income as reported on the firm’s tax return\(^7\), Plesko (2000, 2003) matches financial statement data with confidential tax return data and concludes that current tax expense is a reasonable approximation of actual taxes owed in the current year.

2.2 Prior Literature on the Information Content of Taxable Income

Motivated by a growing gap between firms’ reported book income and estimated taxable income, some policymakers and academics (e.g., Desai, 2005), have called for increased or even complete conformity between book income and taxable income in order to constrain book earnings management and overly aggressive tax planning by forcing firms to make book/tax tradeoffs. Hanlon et al. (2005) study the potential consequences of book/tax conformity by examining the value relevance of taxable income as compared to book income. Since the objective of GAAP is to provide relevant and faithfully-represented information about firm performance to financial statement users, Hanlon et al. predict that book income should be relatively more informative to investors than is taxable income, which is not designed to be a measure of firm performance per se. However, the authors also expect that investors may rely on taxable income as an alternative measure of firm performance due to the lack of subjectivity inherent in the determination of taxable income as compared to book income.

\(^7\) Briefly, these reasons relate to accounting for employee stock options; reserves for uncertain tax positions; intraperiod tax allocation among continuing operations, discontinued operations, and extraordinary items; tax credits; differential tax rates faced by multinational firms; and differing consolidation rules between book and tax. It is generally not possible to adjust the estimate of taxable income to more precisely account for these issues in a large-sample study such as this one. Nonetheless, in unabated robustness tests, I at least partially address these concerns by dropping observations with high research and development expense (which I define as firms in the top quartile of research and development expense scaled by pretax book income), because these firms are likely to have high research and development tax credits. I also drop firms with high foreign income (which I define as firms whose ratio of foreign income to total income is greater than 50%), because these firms are likely to have high foreign tax credits and/or a significant amount of income taxed at rates different from the top U.S. statutory corporate tax rate. The results of these analyses are qualitatively unchanged from the results of my primary tests.
notion that book income is intended to be an informative measure of firm performance, whereas taxable income is not.

2.3 Prior Literature on Market Mispricing of Book Income and Taxable Income

In summary, Hanlon et al. (2005) and Ayers et al. (2009) provide compelling evidence that book income possesses superior ability relative to taxable income to explain contemporaneous stock returns, even when book earnings quality and the degree of tax planning are relatively low (i.e., when book income should be relatively less informative and when taxable income should be relatively more informative). However, an underlying assumption in value relevance studies such as Hanlon et al. and Ayers et al. is that investors correctly impound the information contained in the measures of income under examination (Aboody et al., 2002). Prior research suggests that this is likely not the case with regards to book income and taxable income.

First, numerous studies, such as Sloan (1996) and Xie (2001), document that investors fixate on book income when forming expectations of future earnings and pricing securities. If investors fixate on book income, it follows that the observed superior ability of book income relative to taxable income to explain contemporaneous stock returns could be at least partially attributable to the fact that the market overemphasizes its reliance on book income, rather than book income’s superior information content.

Second, a separate line of research provides evidence that the superior ability of book income relative to taxable income to explain contemporaneous stock returns could be at least partially due to the fact that investors do not fully appreciate the implications of taxable income for future earnings. For example, Lev and Nissim (2004) document that the ratio of taxable income to book income is associated with future earnings growth. However, since the authors also find that this ratio is associated with future abnormal stock returns, Lev and Nissim
value of equity. While the market value of equity is likely contaminated by the same sources of market mispricing that bias the tests conducted by Hanlon et al. and Ayers et al., ex-post intrinsic value, a measure of fundamental firm value developed by Subramanyam and Venkatachalam (2007), attempts to remove market mispricing from the valuation model.

Ex-post intrinsic value is calculated by expressing two popular valuation models, the dividend discount model and the residual income model formalized by Ohlson (1995), over three-year and five-year finite time horizons. In short, ex-post intrinsic value determined using the dividend discount model is calculated by replacing expectations of dividends and terminal stock price in the traditional dividend discount model with three or five years of their ex-post realizations. Similarly, ex-post intrinsic value determined using the residual income model is calculated by replacing expectations of earnings, book value, and terminal stock price in the traditional residual income model with three or five years of their ex-post realizations. The calculation of ex-post intrinsic value is discussed in greater detail in Section 3.1.

Subramanyam and Venkatachalam (2007) contend that by removing investors' potentially-biased expectations from the valuation model, ex-post intrinsic value allows researchers to conduct tests of the relative information content of alternative measures of income (such as book income and taxable income, in the case of this study) that are not confounded by market mispricing. In their empirical tests, the authors find that book income possesses superior ability relative to operating cash flows to explain both the market value of equity and ex-post intrinsic value. Since ex-post intrinsic value is arguably unbiased by market mispricing, the authors conclude that book income’s superior ability relative to operating cash flows to explain firm value (Dechow, 1994) is due to book income’s superior information content and not mispricing arising from the market’s fixation on book income.
although the ability of taxable income relative to book income to explain contemporaneous stock returns increases as book earnings quality and tax planning decrease, book income retains its superior explanatory power, regardless of the degree of book earnings quality or tax planning. My tests are equivalent to those performed by Ayers et al. except that I use a price (levels) rather than a returns (changes) specification. As such, I expect that in my tests the ability of taxable income relative to book income to explain the market value of equity will increase as book earnings quality and tax planning decrease, but that book income will retain its superior explanatory power, regardless of the degree of book earnings quality or tax planning.

However, I argue that at least part of the superior ability of book income relative to taxable income to explain the market value of equity (even in the presence of low book earnings quality and low tax planning) may be due to market mispricing rather than book income’s superior information content. Thus, as before, I expect that book income’s superior explanatory power will decrease once market mispricing is removed from the valuation model. Further, I predict that investors’ overreliance on book income and underreliance on taxable income will lead to more severe mispricing as the information content of taxable income increases. Ayers et al. (2009) suggest that the informativeness of taxable income relative to book income increases as book earnings quality decreases. Therefore, I expect that once market mispricing is removed from the valuation model, the decrease in book income’s superior explanatory power will intensify as book earnings quality decreases. This logic leads to my next hypothesis:

**H2:** When ex-post intrinsic value replaces the market value of equity as the measure of firm value, the decrease in the superior ability of book income relative to taxable income to explain firm value will intensify as book earnings quality decreases.

Ayers et al. (2009) also suggest that the informativeness of taxable income relative to book income increases as tax planning decreases. As before, I predict that investors’ overreliance
U.S. statutory corporate tax rate\(^9\), then subtracting the change in tax net operating loss carryforwards from the result.\(^{10}\) I define this variable as \(TI\). Mathematically, \(TI\) is expressed as:

\[
TI_{it} = \frac{\text{TAXFED}_{it} + \text{TAXFO}_{it}}{\text{STR}_{it}} - \Delta\text{TAXNOL}_{it}
\]

where \(\text{TAXFED}\) is current federal tax expense, \(\text{TAXFO}\) is current foreign tax expense, \(\text{STR}\) is the top U.S. statutory corporate tax rate applicable in period \(t\), and \(\Delta\text{TAXNOL}\) is the change in tax net operating loss carryforwards from period \(t-1\) to period \(t\).\(^{11}\) As discussed earlier, although this estimate of taxable income contains some measurement error, it represents a reasonable approximation of actual taxable income as reported on the firm’s current year income tax return.

I compare the relative abilities of book income and taxable income to explain the market value of equity and ex-post intrinsic value. To provide assurance that the market has had time to respond to the current period’s earnings, I calculate the market value of equity as stock price per share three months after the end of the fiscal year, multiplied by the number of common shares outstanding on the same date. I define this variable as \(MVE\).

Following Subramanyam and Venkatachalam (2007), I calculate ex-post intrinsic value in four ways: using the dividend discount model and the residual income model, each expressed over three-year and five-year finite time horizons.\(^{12}\) For expositional clarity, I only report results from using ex-post intrinsic value calculated based on the five-year residual income model. In

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\(^9\) The top annual U.S. statutory corporate tax rate applicable during my sample period is 46% for years 1986 and earlier, 40% for 1987, 34% from 1988 to 1992, and 35% from 1993 onwards.

\(^{10}\) Mills et al. (2003) document a number of issues with using tax net operating loss data reported in Compustat. These issues generally concern the use of this data to estimate U.S. taxable income, in contrast to this study, in which I estimate worldwide taxable income. Nonetheless, in unabulated robustness tests, I rerun all of the primary analyses in this study after dropping observations with tax net operating loss carryforwards reported in Compustat and find that my results are qualitatively unchanged.

\(^{11}\) Following Hanlon et al. (2005) and Ayers et al. (2009), if either \(\text{TAXFED}\) or \(\text{TAXFO}\) is missing, I calculate worldwide current tax expense as total tax expense less deferred tax expense.

\(^{12}\) In theory, the dividend discount model and the residual income model are equivalent, since the residual income model is merely an algebraic manipulation of the dividend discount model (assuming clean surplus accounting). However, empirical estimates of the two ex-post intrinsic value measures are generally not equal due to measurement errors over finite time horizons.
\[ IV_t = BV_t + \sum_{\tau=1}^{5} \rho^{-\tau} (X_{t+\tau} - (\rho - 1)BV_{t+\tau-1}) + \rho^{-5}(MVE_{t+5} - BV_{t+5}) \]

As discussed earlier, prior research documents that investors fixate on book income and underemphasize the information contained in taxable income when forming expectations of future earnings and pricing securities. As shown above, the market value of equity is a function of these potentially-biased expectations. In contrast, ex-post intrinsic value removes investors’ expectations of future earnings and terminal stock price from the valuation model, and therefore using ex-post intrinsic value instead of the market value of equity as a measure of firm value allows me to conduct tests of the relative information content of book income and taxable income that are arguably unbiased by these sources of market mispricing.\(^{16}\)\(^{17}\)

In my cross-sectional tests, I employ the absolute value of discretionary accruals as a proxy for book earnings quality. I define this variable as \(DACC\). Consistent with Ayers et al. (2009), I calculate \(DACC\) as the absolute value of the residual from the Jones (1991) model of discretionary accruals as modified by Dechow et al. (1995), run cross-sectionally by each industry-year\(^{18}\) with at least 10 observations, as follows:

\[ \frac{TACC_{it}}{TA_{it-1}} = \alpha_0 + \left[ \alpha_1 \left( \frac{1}{TA_{it-1}} \right) + \alpha_2 \left[ \frac{\Delta ASALES_{it} - \Delta REC_{it}}{TA_{it-1}} \right] + \alpha_3 \left( \frac{PPE_{it}}{TA_{it-1}} \right) + \epsilon_{it} \right] \]

\(^{16}\) However, since market value at year \(t+3\) or \(t+5\) is used to express terminal value in the ex-post intrinsic value calculation, this statement assumes that market mispricing of current book income and taxable income does not persist three years or five years hence. This is likely a valid assumption, since Aboody et al. (2002) note that "measurement errors [between intrinsic value and current market value] tend to be resolved in no more than three years."

\(^{17}\) A number of studies, such as Francis et al. (2000), calculate intrinsic value using ex-ante analyst forecasts of accounting attributes rather than their ex-post realizations. However, as mentioned earlier, prior research shows that analysts fixate on book income when making earnings forecasts and that analysts fail to understand the implications of taxable income for future earnings. Therefore, using estimates of intrinsic value calculated using analyst forecasts of accounting attributes is not appropriate for my research design.

\(^{18}\) In this and all other tests, I use two-digit SIC codes to define industries. SIC codes are only available in Compustat for years beginning in 1988. To remedy this issue, I backfill missing SIC codes for earlier years with the first available SIC code.
magnitude of \textit{CETR}, where a higher value of \textit{CETR} indicates greater cash tax expense and therefore suggests that the firm engages in a relatively lower degree of tax planning.

Appendix A summarizes the variables discussed above. All variables are winsorized (reset) at the 1\% and 99\% levels.

3.2 \textit{Sample Selection}

My initial sample consists of 47,366 U.S.-incorporated, non-financial/non-utility firm-year observations with five subsequent years of data available on Compustat, drawn from the period 1983 to 2005.\textsuperscript{21} I first delete 20,669 observations missing data necessary to calculate book income, taxable income, market value of equity, or ex-post intrinsic value. Then, consistent with Subramanyam and Venkatachalam (2007), I delete 1,375 observations with a negative market value of equity or a negative ex-post intrinsic value because negative firm value has no practical meaning. I next delete 6,470 observations with negative book income or negative taxable income because prior research documents a diminished relation between earnings and firm value among loss firms (e.g., Burgstahler and Dichev, 1997; Hayn, 1995) and because of inference issues related to combining samples of profit and loss firms when studying the information content of tax expense (Guenther et al., 2012). This selection procedure results in a final sample of 18,852 firm-year observations representing 3,426 distinct firms available for my full sample tests. Table 1, Panel A summarizes the selection procedure for this sample.

I follow Ayers et al. (2009) and construct two additional subsamples for my cross-sectional tests. The subsample for my tests related to earnings quality begins with my full sample of 18,852 observations. From this full sample, I delete 2,676 observations missing data necessary

\textsuperscript{21} I do not include foreign, financial (SIC codes 4900-4999), or utility (SIC codes 6000-6999) firms in my sample because these firms likely face different accounting rules and tax law than other firms in my sample. I begin my sample in 1983 to be consistent with Ayers et al. (2009). I end my sample in 2005 because the calculation of ex-post intrinsic value requires five years of subsequent data availability.
book income possesses superior ability relative to taxable income to explain contemporaneous stock returns. Consistent with this result, I expect that book income will also possess superior ability relative to taxable income to explain the market value of equity. Therefore, I predict that the $R^2$ of Model (1) is greater than the $R^2$ of Model (2), i.e., that the ratio of the $R^2$ of Model (1) to the $R^2$ of Model (2), hereafter defined as $\text{RATIO}_{\text{MVE}}$, is greater than 100%.

I contend that empirical tests of the relative abilities of book income and taxable income to explain the market value of equity may be inherently biased in favor of book income due to market mispricing arising from investors' fixation on book income and underemphasis on the information contained in taxable income. Thus, it is unclear to what extent book income possesses superior ability relative to taxable income to explain the market value of equity because of market mispricing rather than the superior information content of book income. To examine this issue, I replace the market value of equity with ex-post intrinsic value as the dependent variable in Models (1) and (2), then run a "horse race" between the resulting two regression models:

$$IV_{it} = \gamma_0 + \gamma_1 * PTBI_{it} + \epsilon_{it}$$

(3)

and

$$IV_{it} = \psi_0 + \psi_1 * TI_{it} + \epsilon_{it}$$

(4)

where all variables are as defined earlier and in Appendix A.

As discussed earlier, using ex-post intrinsic value as the dependent variable in place of the market value of equity allows me to conduct empirical tests that are arguably unbiased by

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23 Since each model has the same dependent variable and uses the same sample of observations, it is possible to test the statistical significance of the difference in the explanatory power of the independent variable(s) in each model by using the Vuong (1989) test of the difference in $R^2$ between two non-nested models. The Vuong test has been extensively employed in prior accounting research that studies the relative information content of alternative measures of firm performance (e.g., Subramanyam and Venkatachalam, 2007; Hanlon et al., 2005; Dhaliwal et al., 1999; Dechow, 1994).
book earnings quality and tax planning decrease, but that $\text{RATIO}_{\text{MVE}}$ will nonetheless remain greater than 100% in each quintile of book earnings quality and tax planning.

As discussed earlier, the superior ability of book income relative to taxable income to explain the market value of equity (even in the presence of low book earnings quality and low tax planning) may be at least partially due to market mispricing rather than book income’s superior information content. As before, to conduct tests that attempt to overcome biases due to market mispricing, I replace the market value of equity with ex-post intrinsic value as the measure of firm value, resulting in Models (3) and (4) above. I then run a “horse race” between these models within each quintile of book earnings quality and tax planning.

I expect that the superior ability of book income relative to taxable income to explain firm value will decrease when ex-post intrinsic value replaces the market value of equity as the measure of firm value. Further, H2 and H3 predict that the decrease in the superior explanatory power of book income relative to taxable income will intensify as book earnings quality and tax planning, respectively, decrease. Therefore, H2 predicts that $\text{RATIO}_{\text{IV}}$ will be less than $\text{RATIO}_{\text{MVE}}$ in each quintile of book earnings quality, and that the decrease will intensify as book earnings quality decreases. Similarly, H3 predicts that $\text{RATIO}_{\text{IV}}$ will be less than $\text{RATIO}_{\text{MVE}}$ in each quintile of tax planning, and that the decrease will intensify as tax planning decreases. Note that these hypotheses imply that, as book earnings quality and tax planning decrease, it is possible that the explanatory power of taxable income may even surpass that of book income once market mispricing is removed from the valuation model. Thus, H2 and H3 suggest that it is possible that $\text{RATIO}_{\text{IV}}$ may fall below 100% as book earnings quality and tax planning decrease.

4. Results

4.1 Descriptive Statistics and Correlations
value of equity.\textsuperscript{24} I find that the $R^2$ of Model (1) is 73.15\%, while the $R^2$ of Model (2) is 68.26\%. Thus, $\text{RATIO}_{\text{MVE}}$ is $73.15\% / 68.26\% = 107.16\%$ (z-stat. = 5.63), indicating that, as expected and consistent with Hanlon et al. (2005), book income possesses superior ability relative to taxable income to explain the market value of equity. However, the market value of equity is potentially biased by investors' fixation on book income and underemphasis on the information contained in taxable income when forecasting future earnings and pricing securities. Therefore, it is unclear to what extent the superior ability of book income relative to taxable income to explain the market value of equity is due to these sources of market mispricing rather than book income's superior information content.

To conduct tests of the relative information content of book income and taxable income that attempt to overcome biases related to market mispricing, I next estimate Models (3) and (4), which replace the market value of equity with ex-post intrinsic value as the dependent variable. The results of these tests are reported in Table 4 (and illustrated in Figure 1). I find that book income possesses superior ability relative to taxable income to explain ex-post intrinsic value, with $R^2$s of 46.62\% and 44.29\% in Models (3) and (4), respectively. Thus, $\text{RATIO}_{\text{IV}}$ is only $46.62\% / 44.29\% = 105.26\%$ (z-stat. = 3.53), which is less than $\text{RATIO}_{\text{MVE}}$ of 107.16\% in both magnitude and statistical significance. This decrease between $\text{RATIO}_{\text{MVE}}$ and $\text{RATIO}_{\text{IV}}$ represents a 26.54\% decrease (calculated as $(105.26\% - 107.16\%) / (107.16\% - 100\%)$) in the superior explanatory power of book income relative to taxable income when ex-post intrinsic value replaces the market value of equity as the measure of firm value. This finding provides support for H1 and suggests that book income's superior ability relative to taxable income to

\textsuperscript{24} For expositional clarity, I do not report coefficient estimates on the $\text{PTBI}$ and $\text{TI}$ variables, since my tests are exclusively concerned with the explanatory power, or $R^2$, of each model. I note that the coefficients on $\text{PTBI}$ and $\text{TI}$ are positive and highly statistically significant (all $p < 0.0001$) in all models across all tests.
among firms with the relatively highest quality book earnings), with RATIO$_{IV}$ equal to 109.42\% (z-stat. = 3.11) in this quintile. On the other hand, among observations in the middle three discretionary accruals quintiles, book income and taxable income possess statistically equivalent abilities to explain ex-post intrinsic value, with RATIO$_{IV}$ equal to 105.78\% (z-stat. = 1.12), 105.30\% (z-stat. = 0.96), and 105.58\% (z-stat. = 0.79) in the second through fourth quintiles, respectively. Lastly, among observations in the highest discretionary accruals quintile, I find that the R$^2$ of Model (4) is actually significantly greater than the R$^2$ of Model (3), with RATIO$_{IV}$ equal to only 93.97\% (z-stat. = -2.46) in this quintile. This result indicates that taxable income actually possesses superior ability relative to book income to explain ex-post intrinsic value among firms with the lowest quality book earnings.

Finally, comparing RATIO$_{MVE}$ and RATIO$_{IV}$ indicates that, when ex-post intrinsic value replaces the market value of equity as the measure of firm value, the superior ability of book income relative to taxable income to explain firm value decreases (in both magnitude and statistical significance) in each discretionary accruals quintile except the first. Specifically, I find that the superior explanatory power of book income increases by 18.05\% then decreases by 6.77\%, 62.46\%, 44.20\%, and 223.31\% in the first through fifth quintiles, respectively (as before, these figures are obtained by calculating (RATIO$_{IV}$ – RATIO$_{MVE}$) / (RATIO$_{MVE}$ – 100\%) in each quintile). Although somewhat mixed in the middle quintiles, this trend generally provides support for H2 that the decrease in the superior explanatory power of book income relative to taxable income will intensify as book earnings quality decreases. Indeed, these results indicate that once market mispricing of the information contained in book income and taxable income is removed from the valuation model, the explanatory power of taxable income actually surpasses that of book income among firms with particularly poor book earnings quality.
relatively highest degree of tax planning), with RATIOIV equal to 127.66% (z-stat. = 2.23) and 111.85% (z-stat. = 2.22) in the first and second quintiles, respectively. On the other hand, among observations in the highest three cash ETR quintiles, RATIOIV is equal to only 108.56% (z-stat. = 1.50), 105.10% (z-stat. = 1.02), and 101.14% (z-stat. = 0.11) in the third through fifth quintiles, respectively. These results indicate that book income and taxable income possess statistically equivalent abilities to explain ex-post intrinsic value among firms that engage in a relatively low degree of tax planning.

Lastly, comparing RATIO_{MVE} and RATIOIV indicates that, when ex-post intrinsic value replaces the market value of equity as the measure of firm value, the superior ability of book income relative to taxable income to explain firm value decreases (in both magnitude and statistical significance) in each cash ETR quintile. Specifically, I find that the superior explanatory power of book income decreases by 20.38%, 17.19%, 26.33%, 37.50%, and 77.38% in the first through fifth quintiles, respectively (as before, these figures are obtained by calculating (RATIOIV - RATIO_{MVE}) / (RATIO_{MVE} - 100%) in each quintile). Although this trend is not as pronounced as that of the book earnings quality tests, it generally supports H3 that the decrease in the superior explanatory power of book income relative to taxable income will intensify as tax planning decreases. In fact, these results indicate that once market mispricing of the information contained in book income and taxable income is removed from the valuation model, taxable income and book income possess statistically equivalent abilities to explain firm value among firms that engage in a relatively low degree of tax planning.

4.5 Analysis of Low DACC / Low CETR and High DACC / High CETR Subsamples

My last set of tests examines only those observations in both the lowest quintile of discretionary accruals and lowest quintile of cash ETRs (i.e., those firms with the relatively
ex-post intrinsic value replaces the market value of equity as the measure of firm value, the
decrease in the superior explanatory power of book income relative to taxable income is
184.86% in this subsample, compared to a decrease of only 26.54% in my full sample (reported
in Table 4). This finding is consistent with my prediction that the results of this study will be
especially pronounced among firms with both relatively low quality book earnings and a
relatively low degree of tax planning.

5. Conclusion

In this study, I conduct tests of the relative information content of book income and
taxable income that are arguably unbiased by market mispricing arising from investors’ fixation
on book income and underemphasis on the information contained in taxable income. I report
three primary findings. First, I find that the ability of book income relative to taxable income to
explain firm value decreases when investors’ potentially-biased expectations of future earnings
and stock price are removed from the valuation model. Second, I document that this result
generally intensifies as book earnings quality and tax planning decrease. Third, I find that once
market mispricing is removed from the valuation model, taxable income actually possesses
statistically equivalent or even superior ability relative to book income to explain firm value
among firms with particularly low book earnings quality and firms that engage in a relatively
low degree of tax planning.

This study contributes to the literature on the information content of firms’ tax-related
financial statement disclosures. Using contemporaneous stock returns as the performance
criterion, prior studies generally conclude that book income is superior to taxable income as a
summary measure of firm performance, even in the presence of low book earnings quality and
low tax planning. By conducting tests that overcome biases related to market mispricing, I am
References


Desai, M. 2006. Testimony of Mihir Desai Associate Professor Harvard University before the Subcommittee on Select Revenue Measures (Committee on Ways and Means, House of Representatives May 9).


## Appendix A
### Variable Definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PTBI</strong></td>
<td>Book income, calculated as pretax book income less minority interest.</td>
</tr>
<tr>
<td><strong>TI</strong></td>
<td>Taxable income as estimated from firms’ financial statement data, calculated as worldwide current tax expense (current federal tax expense plus current foreign tax expense, or total tax expense less deferred tax expense if either current federal or current foreign tax expense is missing) divided by the applicable top annual U.S. statutory corporate tax rate, less the change in tax net operating loss carryforwards.</td>
</tr>
<tr>
<td><strong>MVE</strong></td>
<td>Market value of equity, calculated as share price three months after the end of the fiscal year multiplied by the number of common shares outstanding on the same date.</td>
</tr>
<tr>
<td><strong>IV</strong></td>
<td>Ex-post intrinsic value determined pursuant to the residual income model expressed over a five-year finite time horizon. Ex-post intrinsic value is calculated by replacing expectations of earnings, book value, and terminal stock price in the residual income model with their ex-post realizations.</td>
</tr>
<tr>
<td><strong>DACC</strong></td>
<td>The absolute value of discretionary accruals, calculated using the Jones (1991) model of accruals as modified by Dechow et al. (1995), run cross-sectionally by each industry-year with at least 10 observations, including an intercept and scaling all variables by lagged total assets as in Kothari et al. (2005). A higher value of DACC indicates relatively lower book earnings quality.</td>
</tr>
<tr>
<td><strong>CETR</strong></td>
<td>The five-year “long-run” cash effective tax rate, calculated as the sum of cash taxes paid in the current plus four prior years divided by the sum of pretax book income (PTBI as defined above) less special items in the current plus four prior years. A higher value of CETR indicates that the firm engages in a relatively lower degree of tax planning.</td>
</tr>
</tbody>
</table>
Table 1, Cont.
Sample Selection

This table reports the sample selection procedure followed in this study.

Panel C: Tax Planning Tests Subsample

<table>
<thead>
<tr>
<th></th>
<th>Firm-Years</th>
<th>Distinct Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Sample</td>
<td>18,852</td>
<td>3,426</td>
</tr>
<tr>
<td>Less: missing data necessary to calculate the five-year cash effective tax rate</td>
<td>(9,087)</td>
<td>(1,153)</td>
</tr>
<tr>
<td>Less: negative numerator or denominator in the five-year cash effective tax rate calculation</td>
<td>(613)</td>
<td>(167)</td>
</tr>
<tr>
<td>Less: five-year cash effective tax rate greater than 100%</td>
<td>(206)</td>
<td>(83)</td>
</tr>
<tr>
<td>Final Sample for Tax Planning Tests</td>
<td>8,946</td>
<td>2,023</td>
</tr>
</tbody>
</table>
Table 3
Correlations

This table reports Pearson (below the diagonal) and Spearman (above the diagonal) correlations for the primary variables examined in this study. All variables are as defined in Appendix A. For clarity, p-values are omitted. The symbols *, **, and *** indicate correlation coefficients significant at the 10%, 5%, and 1% levels, respectively. Variables are winsorized at the 1% and 99% levels.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>PTBI</th>
<th>TI</th>
<th>MVE</th>
<th>IV</th>
<th>DACC</th>
<th>CETR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTBI</td>
<td>18,852</td>
<td>-</td>
<td>0.93***</td>
<td>0.93***</td>
<td>0.80***</td>
<td>-0.15***</td>
<td>-0.13***</td>
</tr>
<tr>
<td>TI</td>
<td>18,852</td>
<td>0.95***</td>
<td>-</td>
<td>0.89***</td>
<td>0.76***</td>
<td>-0.14***</td>
<td>-0.04***</td>
</tr>
<tr>
<td>MVE</td>
<td>18,852</td>
<td>0.86***</td>
<td>0.82***</td>
<td>-</td>
<td>0.81***</td>
<td>-0.13***</td>
<td>-0.15***</td>
</tr>
<tr>
<td>IV</td>
<td>18,852</td>
<td>0.68***</td>
<td>0.67***</td>
<td>-0.73***</td>
<td>-</td>
<td>-0.11***</td>
<td>-0.13***</td>
</tr>
<tr>
<td>DACC</td>
<td>16,176</td>
<td>-0.07***</td>
<td>-0.06***</td>
<td>-0.05***</td>
<td>-0.05***</td>
<td>-</td>
<td>-0.02*</td>
</tr>
<tr>
<td>CETR</td>
<td>8,946</td>
<td>-0.09***</td>
<td>-0.06***</td>
<td>-0.10***</td>
<td>-0.09***</td>
<td>-0.02**</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 5
Relative Explanatory Power of Book Income and Taxable Income by Discretionary Accruals Quintile

This table reports the explanatory power, or $R^2$, of separate regressions of book income ($PTBI$) and taxable income ($TI$) on the market value of equity ($MVE$) and ex-post intrinsic value ($IV$) within discretionary accrual ($DACC$) quintiles, where a higher quintile indicates a lower degree of book earnings quality. Detailed variable definitions are provided in Appendix A. Coefficients and t-statistics are omitted for clarity. Results of Vuong (1989) tests of the difference in explanatory power between two non-nested models are reported in italics. The symbols *, **, and *** indicate z-statistics significant at the 10%, 5%, and 1% levels, respectively. Variables are winsorized at the 1% and 99% levels.

<table>
<thead>
<tr>
<th>Quintile</th>
<th>n</th>
<th>$PTBI$ $R^2$ (1)</th>
<th>$TI$ $R^2$ (2)</th>
<th>$RATIO_{MVE}$ $R^2$ (3) / $R^2$ (2)</th>
<th>z-stat.</th>
<th>$PTBI$ $R^2$ (3)</th>
<th>$TI$ $R^2$ (4)</th>
<th>$RATIO_{IV}$ $R^2$ (3) / $R^2$ (4)</th>
<th>z-stat.</th>
<th>(RATIO$<em>{IV}$ - RATIO$</em>{MVE}$) / (RATIO$_{MVE}$ - 100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (Low DACC)</td>
<td>3,235</td>
<td>79.18%</td>
<td>73.33%</td>
<td>107.98%</td>
<td>3.53***</td>
<td>52.50%</td>
<td>47.98%</td>
<td>109.42%</td>
<td>3.11***</td>
<td>18.05%</td>
</tr>
<tr>
<td>Q2</td>
<td>3,235</td>
<td>76.03%</td>
<td>71.59%</td>
<td>106.20%</td>
<td>2.01**</td>
<td>45.37%</td>
<td>42.89%</td>
<td>105.78%</td>
<td>1.12</td>
<td>-6.77%</td>
</tr>
<tr>
<td>Q3</td>
<td>3,236</td>
<td>74.82%</td>
<td>65.56%</td>
<td>114.12%</td>
<td>3.09***</td>
<td>44.31%</td>
<td>42.08%</td>
<td>105.30%</td>
<td>0.96</td>
<td>-62.46%</td>
</tr>
<tr>
<td>Q4</td>
<td>3,235</td>
<td>68.72%</td>
<td>62.47%</td>
<td>110.00%</td>
<td>3.12***</td>
<td>44.69%</td>
<td>42.33%</td>
<td>105.58%</td>
<td>0.79</td>
<td>-44.20%</td>
</tr>
<tr>
<td>Q5 (High DACC)</td>
<td>3,235</td>
<td>68.90%</td>
<td>65.69%</td>
<td>104.89%</td>
<td>1.70*</td>
<td>37.22%</td>
<td>39.61%</td>
<td>93.97%</td>
<td>-2.46**</td>
<td>-223.31%</td>
</tr>
</tbody>
</table>
Table 7
Relative Explanatory Power of Book Income and Taxable Income: Low Discretionary Accruals / Low Cash Effective Tax Rate Subsample

This table reports the explanatory power, or $R^2$, of separate regressions of book income ($PTBI$) and taxable income ($TI$) on the market value of equity ($MVE$) and ex-post intrinsic value ($IV$) for those observations in both the lowest quintile of discretionary accruals ($DACC$) and lowest quintile of cash effective tax rates ($CETR$). Detailed variable definitions are provided in Appendix A. Coefficients and $t$-statistics are omitted for clarity. Results of Vuong (1989) tests of the difference in explanatory power between two non-nested models are reported in italics. The symbols *, **, and *** indicate $z$-statistics significant at the 10%, 5%, and 1% levels, respectively. Variables are winsorized at the 1% and 99% levels.

<table>
<thead>
<tr>
<th></th>
<th>$MVE$</th>
<th>$IV$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$PTBI$</td>
<td>$R^2 (1) = 78.66%$</td>
<td>$R^2 (3) = 42.13%$</td>
</tr>
<tr>
<td>$TI$</td>
<td>$R^2 (2) = 64.81%$</td>
<td>$R^2 (4) = 35.45%$</td>
</tr>
<tr>
<td>$R^2$ RATIO</td>
<td>$RATIO_{MVE} = R^2 (1) / R^2 (2) = 121.37%$</td>
<td>$RATIO_{IV} = R^2 (3) / R^2 (4) = 118.84%$</td>
</tr>
<tr>
<td>$z$-stat.</td>
<td>$2.79^{***}$</td>
<td>$2.15^{**}$</td>
</tr>
</tbody>
</table>

PERCENTAGE CHANGE IN THE SUPERIORITY OF BOOK INCOME

$\frac{RATIO_{IV} - RATIO_{MVE}}{(RATIO_{MVE} - 100\%)} = -11.84\%$

n = 296
Figure 1
Graphical Illustration of Table 4

Panel A: Relative Abilities of Book Income ($PTBI$) and Taxable Income ($TI$) to Explain the Market Value of Equity ($MVE$)

Panel B: Relative Abilities of Book Income ($PTBI$) and Taxable Income ($TI$) to Explain Ex-Post Intrinsic Value ($IV$)
**Figure 3**
Graphical Illustration of Table 6

**Panel A:** Relative Abilities of Book Income ($PTBI$) and Taxable Income ($TI$) to Explain the Market Value of Equity ($MVE$), by Cash Effective Tax Rate ($CETR$) Quintile

**Panel B:** Relative Abilities of Book Income ($PTBI$) and Taxable Income ($TI$) to Explain Ex-Post Intrinsic Value ($IV$), by Cash Effective Tax Rate ($CETR$) Quintile
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- Teaching: All levels of tax or financial accounting

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- Do firms initiate dividends to attract institutional ownership tax clienteles? With Robert Trezevant, USC.
  - Currently under first-round review at the Journal of Accounting and Economics.

WORKS IN PROCESS

- Evidence against the catering theory of dividends. With Robert Trezevant, USC. Advanced data analysis stage.

- Managerial overconfidence and subjective accounting standards: evidence from FIN 48. With Kari Olsen and Kara Wells, USC. Data analysis stage.

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